

Youth Activity

CATCHING AIR POLLUTION

When we talk about air pollution, we mean small particles in the air — made up of solids and liquids — that can affect our ability to breathe and cause other health problems. These particles can also be harmful to plants and wildlife and to fish when they land in the water. This project is an easy way to show kids the particulate matter that floats in the air around them, largely unseen.



Learning Objectives

To learn about air pollution by viewing particulate matter (small particles) captured from the air.

Materials

White card stock or cardboard, poster board (any color), petroleum jelly (such as Vaseline®), scissors, ruler, pencil, tape that will adhere to exterior surfaces, permanent marker, and hand lenses (magnifying glasses).

Activity Description

With the children, take a sheet of white card stock or cardboard and cut it into two-inch squares. Next, smear a thin layer of petroleum jelly (Vaseline) evenly onto each square (there's no need to glop it on). Place a rolled-up piece of tape on the back of each square and stick the squares to different vertical surfaces. For example, you might put squares next to a driveway, along a road, or near a fireplace. Use the permanent marker to write the name of the location on the back of each square before you stick it up.

Wait at least 48 hours, depending upon your schedule and the weather forecast (rain will not be helpful), and then retrieve the squares. Bring a sheet of poster board and tape all the square samples to

the poster board to examine more closely later. Make a note on the poster board about where each square was placed outdoors and for how long.

Ask the children to decide which squares have the most particles stuck in the Vaseline. Squares that had been located near automobile traffic, fireplaces, dirt roads and driveways, patches of bare soil, and other sources of particulate matter should be the dirtiest. In early spring, some squares might be yellow with wind-blown pollen. Patches protected from the wind should have fewer particles.

Estimated Time

One hour, plus some added time for preparing and putting up the squares (how much time will depend on how far apart you place the squares).

Ages

Recommended for ages 5 to 8, but take a simple approach to explaining particulate matter in the air.

For ages 9 to 11, no specific changes are needed for this activity, and the discussion of the particles trapped in the Vaseline can be more in-depth.



**Where do you think the particles came from?
What do you think they are?**

Answer(s): Will vary. Possible particle sources include factory emissions, car and truck exhaust, coal-fired power plants, wood stoves, exposed soil from construction sites or farm fields, pollen from plants, particles of crushed rock from gravel roads.

Did you think before doing this investigation that this material was in the air and that you are breathing it?

Answer(s): Will vary.

Do you think these particles in the air might affect your health?

Answer(s): When you breathe in a lot of particles from the air, they can clog your lungs and affect your ability to breathe, leading to shortness of breath and coughing. Very small particles can even get into your blood stream. Airborne particles can contribute to asthma attacks, lead to development of chronic bronchitis, and be particularly dangerous for small children and elderly people. Larger particles can irritate your eyes and nose.

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ILLUSTRATIONS BY PETER GROSSHAUSER

Option: If you want to use this activity for a one-day youth event, cut and smear the squares and place them in different outdoor locations yourself at least 48 hours before your event (depending on the weather forecast). Keep a list of the specific locations where the squares were placed. During the event, you could discuss air pollution and ask the youth which locations they think will have more particles. Or you could create a quiz with the list of locations and ask the youth to rank them in order of where they expect to find the most particles. Then head outside to find the answers!

Discussion Questions

To answer the following questions, it would be helpful to have hand lenses, which the kids can use to inspect the squares. They should especially consider the locations of the squares. Tiny airborne particles, however, travel long distances, so it is not always clear where they come from.

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Particulate matter can also damage the environment. Over time, some particles can make lakes and streams acidic, deplete nutrients in soil that plants need to grow, and damage trees and crops. Acid rain is caused in part by particle pollution.

Mercury particles from coal-fired power plants can cause health problems in humans ranging from brain disorders to heart attacks, and be particularly dangerous for babies and pregnant women. When these particles land in the water, they can cause high mercury levels in fish and any animals that eat those fish – including us!

What do you think you can do to reduce air pollution?

Answer(s): Will vary depending on what sources of pollution are around you. Some topics you could discuss include:

- **Bus Idling:** Does your school allow buses to “idle” (park with the engine on) in front of the school? The exhaust coming out of those busses could contain a lot of harmful particles. Students will breathe in these particles when they come outside at the end of the school day. The particles can even get inside the school through open windows and the air intake system. Talk to your teacher and

principal about an anti-idling policy for your school. Get your friends involved. You can find a sample policy on the EPA Web site at http://epa.gov/cleanschoolbus/idling_policy.htm.

- **Electricity:** Conserve electricity at home. Until cleaner sources of electricity are more widely available, cutting back on electricity use will help cut back on power plant emissions of pollution. Ways you can help include turning off lights when you leave the room and turning off electronics when you’re not using them. (Encourage the kids to add other ideas.)
- **Cars:** Carpool with friends to events and ride your bike, skateboard, or scooter for short trips to decrease car emissions that contribute to particle pollution.
- **Fireplaces:** Talk with your family about cutting back on using candles, wood-burning stoves, and fireplaces at home. These all can contribute to particle pollution.





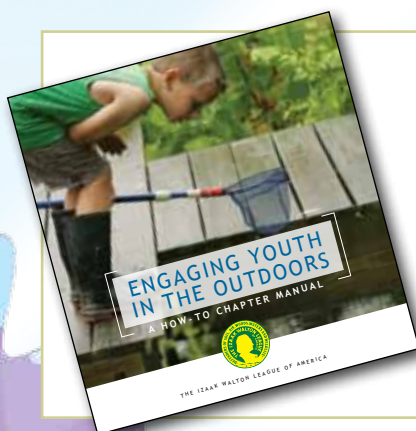
RELATED SOURCES

Particulate Matter: www.epa.gov/pm

What Is Particulate Matter? www.airinfnow.org/html/ed_particulate.html

Young Ikes Activity Book – Ages 5 to 8,
by the Izaak Walton League of America, 2011.
Page 3—Air.

Young Ikes Activity Book – Ages 9 to 11,
by the Izaak Walton League of America, 2011.
Page 4—Air.



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*Engaging Youth in
the Outdoors* manual!

See page 19 to order.